APPENDIX G-5

WIND EROSION EMISSION ESTIMATES

APPENDIX G5: WIND EROSION EMISSION ESTIMATES

This appendix provides a summary of fugitive dust emissions that would be generated by wind erosion from areas disturbed by off-road vehicle maneuver activity under all project alternatives. Emission estimates are presented for each installation under each alternative. Also presented are charts summarizing the wind erosion emission rate estimates developed for each installation. Wind erosion emission rates were developed by a special emission rate model that accounts for the silt content of affected soils, the frequency of precipitation events, unusual soil density properties, local wind speed frequency distributions, and the expected extent of vegetation cover that would be maintained on the affected areas. The extent of vegetation cover on the affected areas was estimated from vehicle use intensity parameters using vehicle activity data consistent with the off-road vehicle use estimated summarized in Appendix G3.

The detailed spreadsheets documenting the emission calculations generally do not lend themselves to hard copy printing. Electronic versions of the spreadsheets can be made available on request.

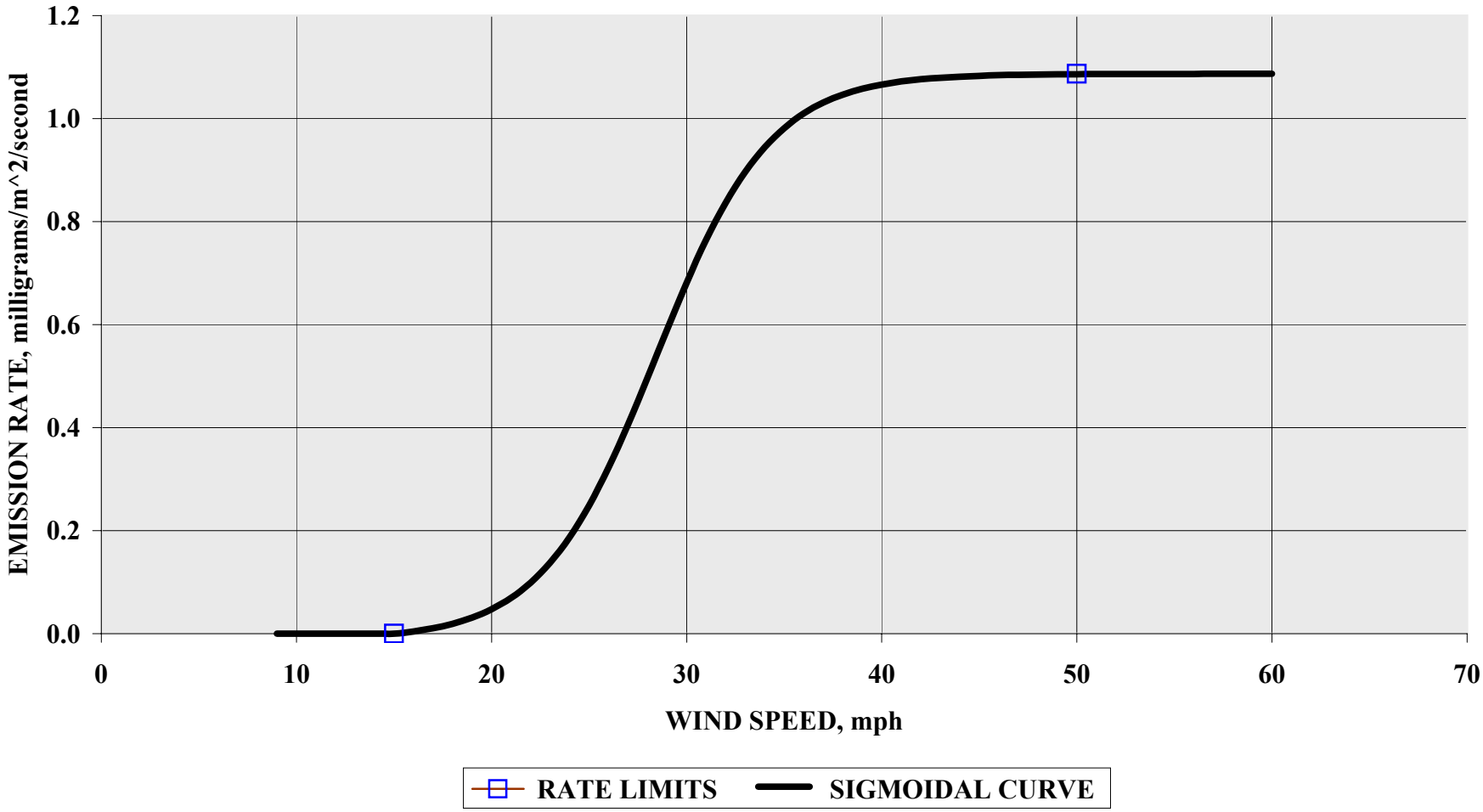
ESTIMATED ANNUAL PM10 EMISSIONS FROM WIND EROSION AT VEHICLE MANEUVER AREAS

INSTALLATION	BARE SOIL PM10 WIND EROSION RATE, lbs/acre/year	NO ACTION			REDUCED SOUTH RANGE ACQUISITION				PROPOSED ACTION			
		MANEUVER AREA, Acres	OFF-ROAD VEHICLE USE, VMT/Year	WIND EROSION PM10 EMISSIONS, Tons/Year	MANEUVER AREA, Acres	OFF-ROAD VEHICLE USE, VMT/Year	WIND EROSION PM10 EMISSIONS, Tons/Year	NET CHANGE IN PM10 EMISSIONS, Tons/Year	MANEUVER AREA, Acres	OFF-ROAD VEHICLE USE, VMT/Year	WIND EROSION PM10 EMISSIONS, Tons/Year	NET CHANGE IN PM10 EMISSIONS, Tons/Year
Dillingham Military Reservation	1,647.2	507	181,340	60.5	507	223,069	90.5	29.9	507	223,069	90.5	29.9
Kahuku Training Area	5,190.3	622	123,641	93.1	622	233,838	256.6	163.5	622	233,838	256.6	163.5
Schofield Barracks Main Post	8.2	125	41,279	0.1	125	67,497	0.3	0.2	200	67,497	0.2	0.1
Schofield Barracks East Range	5.8	440	96,319	0.2	440	157,494	0.3	0.2	440	157,494	0.3	0.2
Pohakuloa Training Area, Main Post	4,283.9	8,843	349,727	844.6	8,843	165,357	712.8	-131.8	8,843	165,357	712.8	-131.8
Pohakuloa Training Area, West Acquisition	10,379.6	0	0	0.0	22,675	496,070	1,733.9	1,733.9	22,675	496,070	1,733.9	1,733.9
SCHOFIELD SUBTOTAL		565	137,598	0.29	565	224,991	0.62	0.33	640	224,991	0.53	0.24
O'AHU SUBTOTAL		**1,694**	**442,579**	**153.92**	**1,694**	**681,898**	**347.66**	**193.74**	**1,769**	**681,898**	**347.57**	**193.65**
ISLAND OF HAWAI'I SUBTOTAL		**8,843**	**349,727**	**844.56**	**31,518**	**661,427**	**2,446.69**	**1,602.13**	**31,518**	**661,427**	**2,446.69**	**1,602.13**
GRAND TOTAL		**10,537**	**792,306**	**998.49**	**33,212**	**1,343,324**	**2,794.35**	**1,795.87**	**33,287**	**1,343,324**	**2,794.26**	**1,795.78**

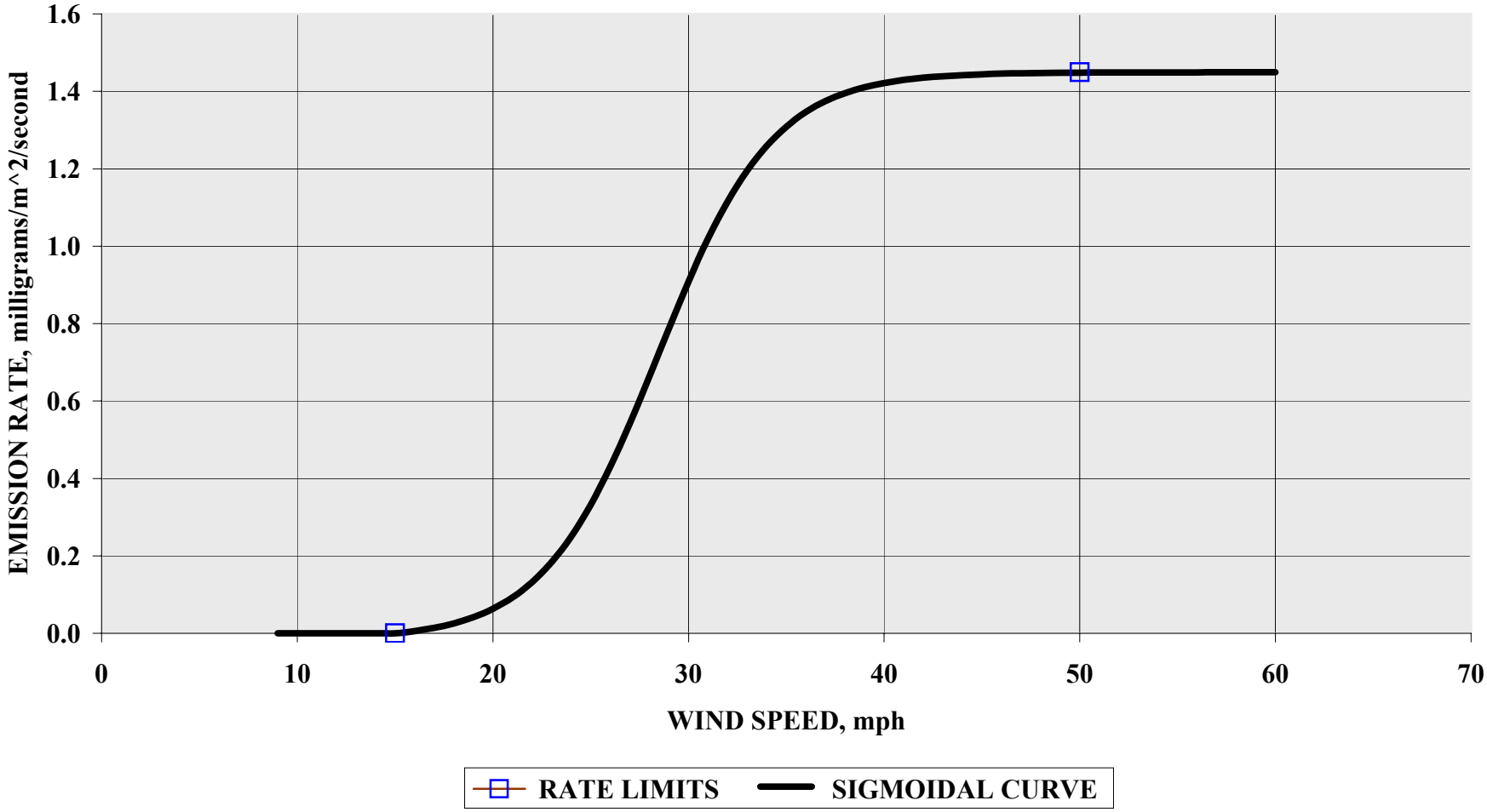
Notes:
PM10 = inhalable particulate matter (below 50 microns aerodynamic equivalent diameter); the "10" in PM10 is a 50% mass collection efficiency size for sampling devices, not a size limit.
VMT = vehicle miles of travel
PM10 wind erosion emission rates (pounds per acre per year) account for soil texture category, the local wind speed frequency distribution, and local precipitation frequency. Low wind speeds and high precipitation frequency normally eliminate wind erosion hazards at Schofield Barracks.
VMT estimates are derived from estimated vehicle use frequencies, with total use allocated by range to paved roads, unpaved roads, and off-road areas.
Annual VMT estimates are converted into nominal cumulative vehicle track arcreage assuming 12-inch tire widths.
Cumulative annual track acreage is compared to available maneuver area acres to derive a use intensity ratio.
Percentage point reductions in baseline vegetation cover factors are estimated from the use intensity ratio; a use intensity ratio of 200 assumed to indicate complete loss of vegetation.
Bare soil PM10 emission rates are reduced by vegetation cover according to a non-linear relationship (23% vegetation cover provides a 50% reduction in wind erosion).

Source:
Tetra Tech staff analyses.

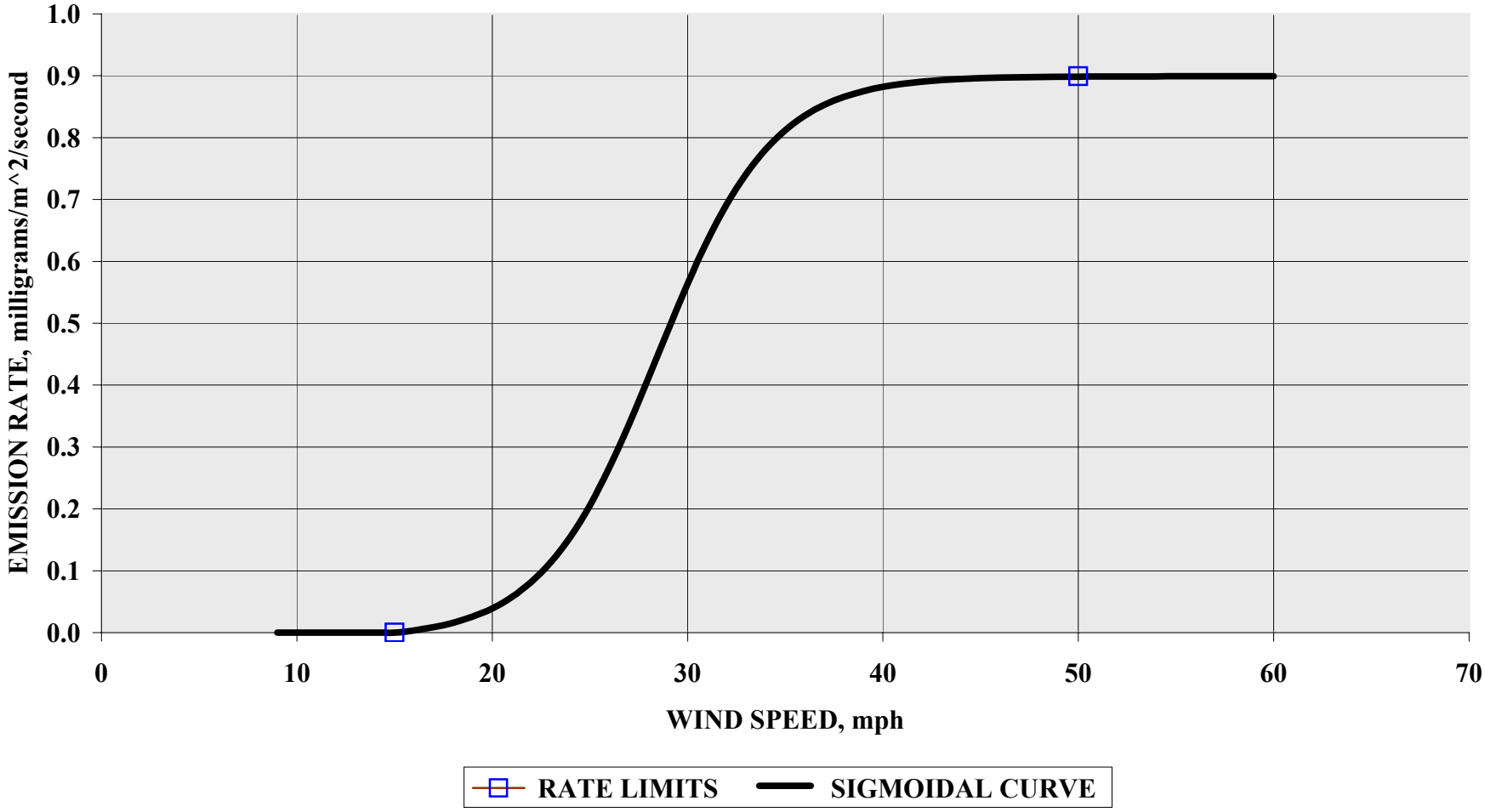
WIND EROSION RATES FOR SCHOFIELD BARRACKS, MAIN POST, NORMAL SOILS, 60% PM10 CONTENT



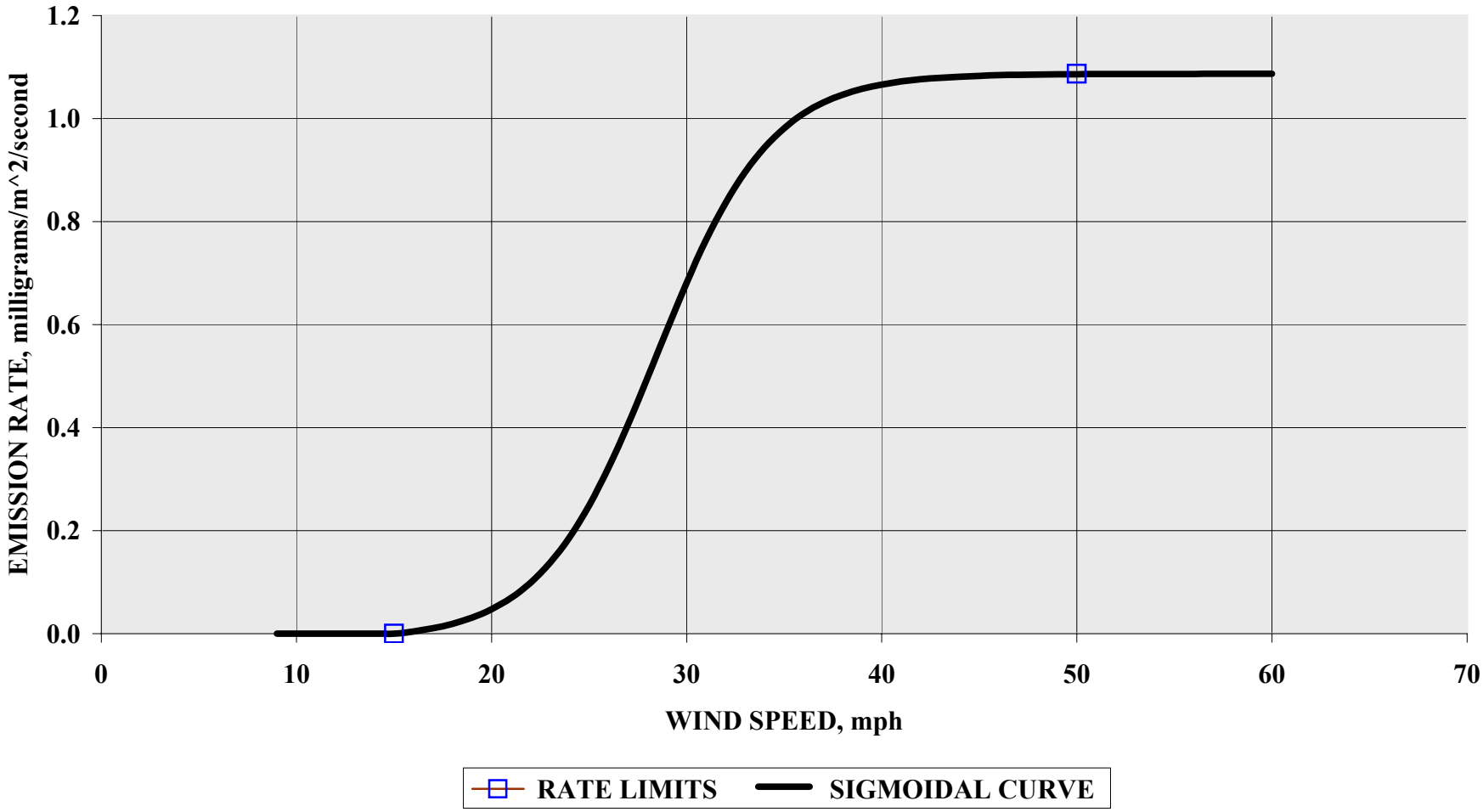
WIND EROSION RATES FOR SCHOFIELD BARRACKS, EAST RANGE, NORMAL SOILS, 60% PM10 CONTENT



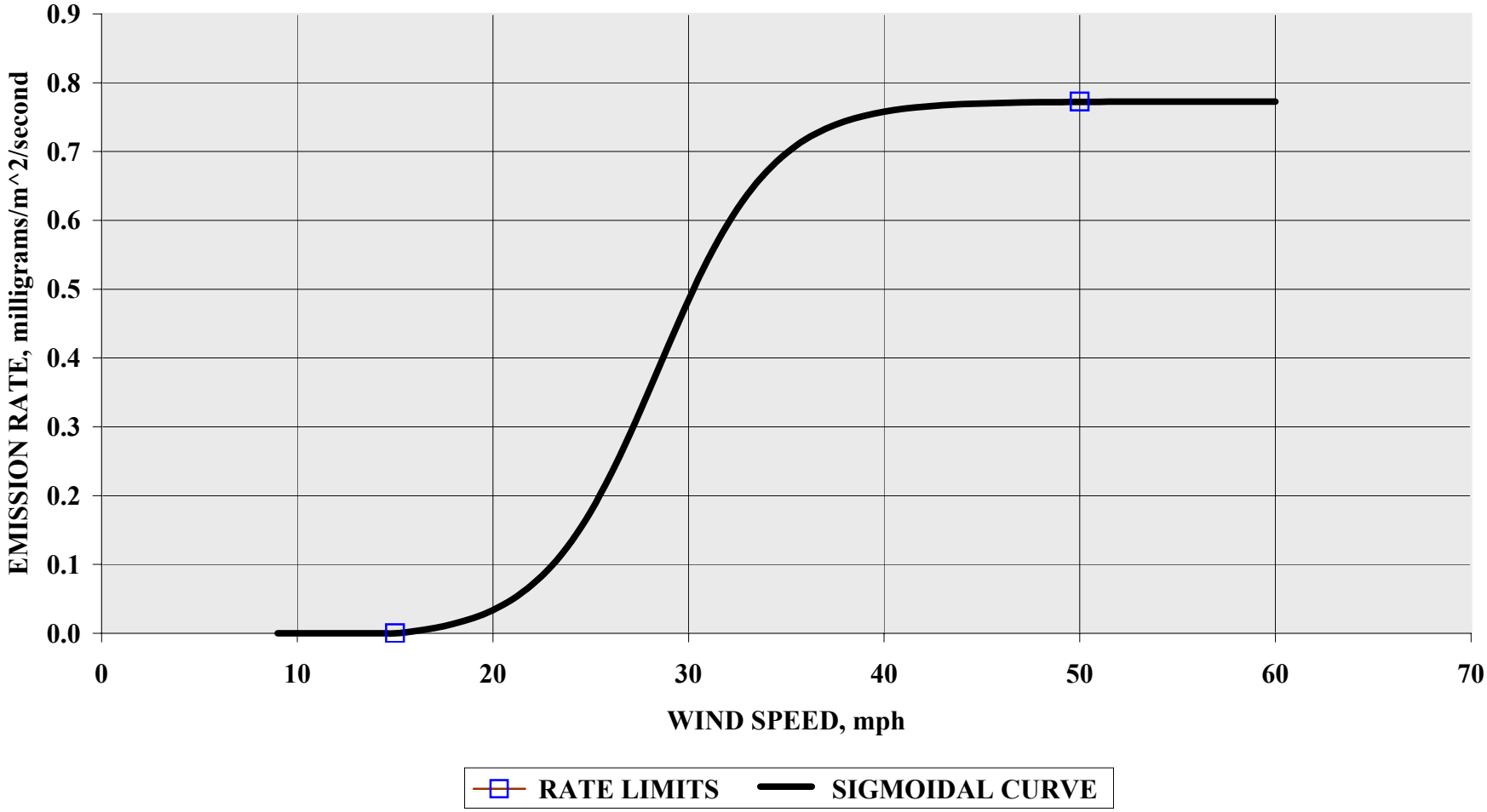
WIND EROSION RATES FOR DILLINGHAM MILITARY RESERVATION, NORMAL SOILS, 50% PM10 CONTENT



WIND EROSION RATES FOR KAHUKU TRAINING AREA, NORMAL SOILS, 60% PM10 CONTENT



WIND EROSION RATES FOR POHAKULOA TRAINING AREA, IMPACT AREA, NORMAL SOILS, 15% PM10 CONTENT



WIND EROSION RATES FOR POHAKULOA TRAINING AREA, KEAMUKU PARCEL, UNUSUAL HAZARD SOILS, 70% PM10 CONTENT